BIBLIOGRAPHICAL NOTICES.

Geology of Northumberland and Durham, with a Geological Map. By George Tate, F.G.S. (From the Nat. Hist. Trans. of Northumb. and Durham.) 8vo. Newcastle, 1867.

An Essay on the Geology of Cumberland and Westmoreland. By H. A. Nicholson, D.Sc., M.B., F.G.S., &c. 8vo. London, 1868.

The Geological Surveyors of Great Britain have not yet, by far, finished their examination of the northern counties of England, which, though comprising the great coal-field of Newcastle and Durham on the east, and that of Whitehaven on the west, and containing the rich lead-mines of Allendale and the hæmatite-mines of Ulverstone, are for the most part bleak and barren, whether presenting moorlands of sand-rock and limestone in Northumberland and western Durham, or equally barren crags and mountains in the more picturesque Lake-district. These regions, however, have not had less attention from geologists than the more fertile lands to the south, or than the well-worked districts of Scotch geology. Newcastle has had its eminent geologists, and continues to publish the scientific transactions of its naturalists, with successive observations made by good geologists from the Tees to the Tweed. Mr. George Tate's memoir, before us, is one of these well-considered communications, based on the long experience and daily notes of a local observer, to whom every hill and vale, every crag and dene, every stream and loch are familiar, who has watched the changes of the coast, the cuttings of roads, the excavations of quarries, and all the minute but important evidences of geological structure given by wells, by husbandry, by pickaxe and spade, from season to season and year to year. The principal object of this pamphlet (being an introduction to the elaborate memoir entitled "A new Flora of Northumberland and Durham," forming volume ii. of the Nat. Hist. Transact. of Northumb. and Durham) is to supply data to help the botanist to see how far the flora of these two counties is influenced by geological structure; and therefore the mineral characters and range of the various rock-masses are specially treated of; but the history of the rocks, as successive formations characterized by different organisms, is also indicated with clearness, as well as the disturbances they have suffered by subterranean action, accompanied with volcanic rocks, and giving rise to many features of the country. Besides these igneous rocks (such as greenstone and basalt, of Post-carboniferous age, and Postsilurian syenite and porphyry), Mr. G. Tate has to notice:—the superficial peat and gravels, and the older gravels, sands, and boulder-clay of the Glacial period; the probably Triassic sandstones of South Durham; the various members of the Permian group; the rich and interesting Carboniferous formations, namely, Coal-measures, Millstone-grit, Mountain-limestone (in its upper part calcareous, and carbonaceous below), and Tuedian beds (well defined and thus named by Mr. Tate in 1856): the Upper

Old Red Sandstone in patches (with *Adianthoides hibernicus* in Berwickshire and *Sigillaria* (?) in Roxburghshire); and some Cambro-Silurian (Lower Silurian) rocks in the western part of Northumberland. A very neat little geological map, printed in colours, accompanies the paper, and shows (as far as a small scale permits) considerable improvements in detail, compared with other maps of this part of the north of England.

For Cumberland and Westmoreland we have Dr. Nicholson's comprehensive memoir above mentioned, in which are noticed the writings of many others, including the results of some of the work of the Geological Survey in the Lake-district, given by Mr. Hughes in 1866, as well as the fruits of Prof. Harkness's persevering and acute examination of the Lake-district and neighbouring region, often in company with the author himself. Some limited traces of Liassic and Triassic strata in Cumberland are briefly noticed. The next lowest beds of the district are the Permian; and considerable addition to our knowledge of this group has been made by Prof. Harkness, following up Mr. Binney's indications some few years since. Of Carboniferous rocks, there are the Coal-measures of Whitehaven, the sandy beds equivalent to the Millstone-grit, the Yoredale beds, and the Scar limestone; then succeed the Upper Old Red Sandstone and the Silurian rocks, comprising equivalents of the Ludlow beds above, and the Coniston grits, Coniston flags, and Coniston limestone in descending order, and, still lower, the green-slates and porphyries, and the Skiddaw slates, which have been freely traversed by granite and other igneous rocks; whilst the whole have been contorted, dislocated, and most extensively denuded. These rocks and strata are described in detail; the faultings, so important a feature in the structure of the Lake-district, are dwelt upon, especially in the introduction; the characters, features, and effects of the igneous rocks, and the glaciation of some granitic and other masses, are amongst the most important subjects of research.

In the theoretical views of Dr. Nicholson as to the early conditions and changes of the Lake-district, geologists have much to discuss; and we think that our author is hasty in putting aside the late W. Hopkins's views of the geometrical relations of the old faults of this region. The correlation of the older palæozoic beds and fossils of Cumbria with those of Cambria will perhaps long give rise to vexed questions among palæontologists, and certainly will not yet bear dogmatic collocations. Little, however, can be done without good conscientious work, such as that of which this pamphlet is the result. There is no rest for the geologist's hammer, except when the pen is recording or revising its discoveries; so we trust that this essay, at first written as a University thesis, and now published with corrections and additions, will still be amended and enlarged with new work and new results from time to time. It is at present illustrated with several bold sectional diagrams; these will have to be replaced with sections on truer scale and with more accuracy of detail. In the meantime, in its present state, we are sure that

both geologist and tourist will find it a useful book, suggestive of valuable thoughts for the speculative, and of good lines of research for the practical man—helping, in the study, to the memory of former labours in this region, and, in the field, showing where wholesome pleasure may be gleaned in hunting out the history of rock and fossil, of hill and lake, and, indeed, of the world itself.

A Monograph of the Recent British Ostracoda. By George Stewardson Brady, Esq. (Trans. Linn. Soc. vol. xxvi.)

The whole of the last-issued Part of the Linnean Transactions is occupied by the monograph which we are about to notice, and which extends to 143 pages, illustrated by nineteen plates.

We have here a most valuable contribution to the history and elucidation of the Ostracoda. The study of this section of the Crustacea has, both on the Continent and in the British Islands, been recently attracting much greater notice, and, we venture to prophecy, is destined to occupy a much larger share of the attention both of zoologists and geologists than it has hitherto done. This is the only order of the Crustacea the remains of which have been found fossil throughout a long series of beds in considerable abundance; and they are likely, when more diligently searched for, hereafter to render important service in assisting the geologist in the classification and sequence of strata. They present certain advantages for this purpose over the Mollusca and other larger organisms, because the small and generally strong valves of their minute carapaces will often escape destruction when it fares badly with their larger brethren. For example, glacial action, which will grind to pieces all univalve and bivalve shells, may be expected to leave unharmed the *Cythere* or the *Bairdia*—just in the same way as while we crush the snail to atoms under our foot, the little ant which was there at the same time, so far from objecting to the operation, turns smacking his lips to the dainty morsel which we leave him to enjoy. A more careful washing of glacial clays and attentive search for the Ostracoda which they may contain will be found no unimportant step in the determination of the circumstances under which a particular bed was deposited, as showing whether it owes its origin to subaërial or true glacial ice, or was a submarine or icebergal deposit. Indeed, so abundant are fossil specimens, that with our present workers in the field, Messrs. Brady, Norman, Robertson, &c. collecting the recent forms, and Messrs. Crosskey, Robertson, &c. the Tertiary and, more especially, Quaternary forms, it has become a mere toss-up whether a species shall first be found fossil and then recent, or *vice versâ*. Of the species described by Mr. Brady, no less than fifty-six marine and six freshwater species have already been met with fossil in the glacial and other more recent deposits; and what makes this the more striking, as showing how completely this study is even now in its infancy, is the fact that no less than forty-three out of the fifty-six marine species referred to, and which are